

List of Pending Claims

1. (Previously Presented) A fire resistant composition for forming a fire resistant ceramic at elevated temperatures, the composition comprising:
 - at least 15% by weight based on the total weight of the composition of a polymer base composition comprising at least 50% by weight of the polymer base composition of an organic polymer;
 - at least 15% by weight based on the total weight of the composition of particulate silicate mineral filler for providing a solid ceramic material at temperatures encountered under fire conditions;
 - at least one source of fluxing oxide selected from the group consisting of
 - (a) fluxing oxides which form a liquid phase in the composition at a temperature of less than 1000°C and are selected from the group consisting of metal oxides, phosphorous oxides and boron oxide, and
 - (b) materials which form the said fluxing oxides at temperatures below 1000°C; and,wherein after exposure to an elevated temperature experienced under fire conditions, the residue remaining is a ceramic in an amount of at least 40% by weight of the total fire resistant composition and wherein the source of fluxing oxide is present in an amount to provide the residue with fluxing oxide in an amount of from 1 to 15% by weight of the residue remaining after exposure to an elevated temperature experienced under fire conditions whereby the fluxing oxide provides binding of the particles of silicate mineral filler to form a coherent ceramic residue at temperatures encountered under fire conditions.
2. (Original) The fire resistant composition of claim 1, wherein the silicate mineral filler is present in an amount of at least 25% by weight based on the total weight of the composition.
3. (Previously Presented) The fire resistant composition of claim 1, wherein the source of fluxing oxide is present in an amount to provide fluxing oxide in the

residue in an amount of 1-10 wt.% after exposure to said elevated temperatures.

4. (Previously Presented) The fire resistant composition of claim 1, wherein the source of fluxing oxide is present in an amount to provide fluxing oxide in the residue in an amount of 2-8wt. % of the residue after exposure to said elevated temperature.

5. (Canceled)

6. (Previously Presented) A fire resistant composition of claim 1, wherein the composition forms a self-supporting structure when heated to an elevated temperature experienced under fire conditions.

7. (Previously Presented) The fire resistant composition of claim 1, wherein the fire resistant composition comprises a source of fluxing oxide in addition to any source of fluxing oxide present in said silicate mineral filler.

8. (Previously Presented) The fire resistant composition of claim 1, wherein the composition comprises a source of fluxing oxide other than any present in said silicate mineral filler and said source of fluxing oxide other than any present in said silicate mineral filler is present in an amount to provide fluxing oxide in the residue in an amount of from 1 to 15% by weight of the residue remaining after exposure to an elevated temperature experienced under fire conditions.

9. (Previously Presented) The fire resistant composition of claim 8, wherein the composition comprises at least two different sources of fluxing oxides which form liquid phases at different temperatures.

10. (Cancelled)

11. (Previously Presented) A fire resistant composition of claim 8, wherein the source of fluxing oxide comprises at least one oxide of an element selected from the group consisting of lead, antimony, boron, lithium, potassium, sodium, and vanadium.

12. (Previously Presented) A fire resistant composition of claim 1,

wherein the composition has less than 10% change in linear dimension after heating at an elevated temperature experienced under fire conditions.

13. (Previously Presented) A fire resistant composition of claim 1, wherein the composition has less than 5% change in linear dimension after heating at an elevated temperature experienced under fire conditions.

14. (Previously Presented) A fire resistant composition of claim 1, wherein the composition remains coherent when heated to temperatures of less than 1050°C for 30 minutes.

15. (Previously Presented) The fire resistant composition of claim 1, wherein after exposure to an elevated temperature experienced under fire conditions, the fire resistant composition has a flexural strength of at least 0.3 MPa.

16. (Previously Presented) A fire resistant composition of claim 1, wherein the organic polymer is selected from the group consisting of thermoplastic polymers, thermoset polymers and elastomers.

17. (Previously Presented) A fire resistant composition of claim 1, wherein the organic polymer comprises at least one of homopolymer or copolymer or elastomer or resin of polyolefins, ethylene-propylene rubber, ethylene-propylene terpolymer rubber (EPDM), chlorosulfonated polyethylene and chlorinate polyethylene, vinyl polymers, acrylic and methacrylic polymers, polyamides, polyesters, polyimides, polyoxymethylene acetals, polycarbonates, polyurethanes, natural rubber, butyl rubber, nitrile-butadiene rubber, epichlorohydrin rubber, polychloroprene, styrene polymers, styrene-butadiene, styrene-isoprene-styrene, styrene-butadiene-styrene, styrene-ethylene-butadiene-styrene, epoxy resins, polyester resins, vinyl ester resins, phenolic resins, and melamine formaldehyde resins.

18. (Previously Presented) The fire resistant composition of claim 1, wherein the polymer base composition comprises from 15 to 75wt.% of the formulated fire resistant composition.

19. (Previously Presented) The fire resistant composition of claim 1, wherein the silicate mineral filler comprises at least one selected from the group consisting of alumino-silicates, alkali alumino-silicates, magnesium silicates and calcium silicates.

20. (Previously Presented) The fire resistant composition of claim 1, comprises an additional inorganic filler selected from the group consisting of silicon dioxide and metal oxides of aluminium, calcium, magnesium, zircon, zinc, iron, tin and barium and inorganic fillers which generate one or more of these oxides when they thermally decompose.

21. (Previously Presented) The fire resistant composition of claim 1, wherein the polymer base composition further comprises a silicone polymer.

22. (Previously Presented) The fire resistant composition of claim 21, wherein the weight ratio of organic polymer to silicone polymer is within the range of 5:1 to 2:1.

23. (Previously Presented) The fire resistant composition of claim 1, further comprising a silicone polymer in an amount of from 2 to 15 wt.% based on the total weight of the formulated fire resistant composition.

24. (Previously Presented) A fire resistant composition of claim 1, wherein the elevated temperature experienced under fire conditions is 1000°C for 30 minutes.

25. (Previously Presented) A fire resistant composition according to claim 1, comprising:

20 to 75% by weight of said polymer base composition wherein said composition further comprises a silicone polymer;

at least 15% by weight of an inorganic filler wherein said inorganic filler comprises mica and a glass additive; and

wherein the source of fluxing oxide comprises glass and a source of fluxing oxide is present in mica wherein, the ratio of mica: glass is in the range of from 20:1 to 2:1.

26. (Previously Presented) A fire resistant composition according to claim

25, wherein the polymer base composition comprises organic non-silicone polymer and silicone polymer in the weight ratio of from 5:1 to 2:1; said inorganic filler comprises 10 to 30% by weight of the total composition of mica and 20 to 40% by weight of the total composition of an additional inorganic filler.

27. (Previously Presented) A fire resistant composition of claim 1, wherein the fluxing oxide is present in the residue in an amount in excess of 5% by weight of the residue, said fluxing oxide forming a glassy surface layer on the ceramic formed on exposure to fire, said glassy surface layer forming a barrier layer which increases the resistance to passage of water and gases.

28. (Previously Presented) A fire resistant cable comprising a conductive element and at least one insulating layer and/or sheathing layer made of a fire resistant composition for providing a fire resistant ceramic under fire conditions, the fire resistant composition comprising:

a fire resistant composition for forming a fire resistant ceramic at elevated temperatures, the composition comprising:

at least 15% by weight based on the total weight of the composition of
a polymer base composition comprising at least 50% by weight
of the polymer base composition of an organic non-silicone
polymer;

at least 15% by weight based on the total weight of the composition of
a particulate silicate mineral filler for providing a solid ceramic
material at temperatures encountered under fire conditions;

at least one source of fluxing oxide selected from the group consisting
of fluxing oxides which form a liquid phase in the composition
at a temperature of less than 1000°C and are selected from the
group consisting of metal oxides, phosphorous oxides and
boron oxide, and fluxing oxide precursors which form said
fluxing oxide at temperatures below 1000°C; and

wherein after exposure to an elevated temperature experienced under fire

conditions, the residue remaining is a ceramic in an amount of at least 40% by weight of the total fire resistant composition and wherein the source of fluxing oxide is present in an amount to provide the residue with fluxing oxide in an amount from 1 to 15% by weight of the residue remaining after exposure to an elevated temperature experienced under fire conditions whereby the fluxing oxide provides bonding of the particles of silicate mineral filler to form a coherent ceramic residue at temperatures encountered under fire conditions.

29. (Previously Presented) A fire resistant cable of claim 28, wherein the silicate mineral filler is present in the residue in an amount of at least 25% by weight based on the total weight of the composition.

30. (Previously Presented) The fire resistant cable of claim 28, wherein the source of fluxing oxide in the fire resistant composition is present in an amount to provide fluxing oxide in the residue in an amount of 1-10 wt.% after exposure to said elevated temperatures.

31. (Previously Presented) The fire resistant cable of claim 28, wherein the source of fluxing oxide in the fire resistant composition is present in an amount to provide fluxing oxide in the residue of the fire resistant composition in an amount of 2-8 wt.% after exposure to said elevated temperature.

32. (Canceled)

33. (Previously Presented) A fire resistant cable of claim 28, wherein the composition forms a self-supporting structure when heated to an elevated temperature experienced under fire conditions.

34. (Previously Presented) The fire resistant cable of claim 28, wherein the fire resistant composition comprises a source of fluxing oxide in addition to said silicate mineral filler.

35. (Previously Presented) The fire resistant cable of claim 28, wherein the composition comprises at least one source of fluxing oxides other than in said silicate

mineral filler provides from 1 to 15% by weight of said residue remaining after exposure to an elevated temperature experienced under fire conditions.

36. (Previously Presented) The fire resistant cable of claim 34, wherein the fire resistant composition comprises at least two different fluxing oxides or precursors to fluxing oxides which form liquid phases at different temperatures.

37. (Previously Presented) A fire resistant cable according to claim 34, wherein at least one source of fluxing oxide comprises one or more materials selected from the group consisting of borates, metal hydroxides, metal carbonates and glasses.

38. (Previously Presented) A fire resistant cable according to claim 34, wherein the source of fluxing oxide comprises at least one selected from the group consisting of an oxide of an element selected from the group consisting of boron, lithium, potassium, sodium, vanadium, lead and antimony.

39. (Previously Presented) A fire resistant cable of claim 28, wherein the composition has less than 10% change in linear dimension after heating at an elevated temperature experienced under fire conditions.

40. (Previously Presented) A fire resistant cable of claim 28, wherein the composition has less than 5% change in linear dimension after heating at an elevated temperature experienced under fire conditions.

41. (Previously Presented) A fire resistant cable of claim 28, wherein the fire resistant composition remains coherent when heated to temperatures of less than 1050°C for 30 minutes.

42. (Previously Presented) A fire resistant cable of claim 28, wherein the organic polymer is a thermoplastic and crosslinked olefin based polymer selected from the group consisting of homopolymers of olefins, copolymers or terpolymers of one or more olefins and a blend of homopolymers, copolymers and terpolymers.

43. (Previously Presented) A fire resistant cable of claim 28, wherein the organic polymer comprises at least one of homopolymer or copolymer or elastomer or resin of polyolefins, ethylene-propylene rubber, ethylene-propylene terpolymer rubber (EPDM), chlorosulfonated polyethylene and chlorinate polyethylene, vinyl polymers, acrylic and methacrylic polymers, polyamides, polyesters, polyimides, polyoxymethylene acetals, polycarbonates, polyurethanes, natural rubber, butyl rubber, nitrile-butadiene rubber, epichlorohydrin rubber, polychloroprene, styrene polymers, styrene-butadiene, styrene-isoprene-styrene, styrene-butadiene-styrene, styrene-ethylene-butadiene-styrene, epoxy resins, polyester resins, vinyl ester resins, phenolic resins, and melamine formaldehyde resins.

44. (Previously Presented) A fire resistant cable of claim 28, wherein the fire resistant composition comprises an additional inorganic filler selected from the group consisting of silicon dioxide and metal oxides of aluminium, calcium, magnesium, zircon, zinc, iron, tin and barium and inorganic fillers which generate one or more of these oxides when they thermally decompose.

45. (Original) A fire resistant cable comprising a conductive element and at least one insulating layer and/or sheathing layer made of a fire resistant composition of claim 1.

46. (Previously Presented) A fire resistant cable of claim 28, wherein the polymer base composition in the fire resistant composition further comprises a silicone polymer.

47. (Original) A fire resistant product formed from the composition of claim 1.

48. (Cancelled)

49. (Previously Presented) A fire resistant composition of claim 8 wherein the source of fluxing oxides comprises a fluxing oxide component consisting essentially of oxides of at least one of lead, antimony, baron, lithium, potassium, sodium and vanadium.

50. (Previously Presented) A fire resistant cable according to claim 35 wherein the source of fluxing oxides comprises a fluxing oxide component consisting essentially of oxides of at least one of lead, antimony, baron, lithium, potassium, sodium and vanadium.

51. (Withdrawn) A fire resistant composition according to claim 1 wherein the silicate mineral filler is a mica and contains the total source of fluxing oxide.

52. (Previously Presented) A fire resistant cable according to claim 28 wherein the silicate mineral filler contains the total source of fluxing oxide.